

CLAIMS

1. (currently amended) A method for modeling a behavior of an electrical circuit, comprising:
forming a trained neural network which models the behavior of the electrical circuit,
wherein the behavior of the electrical circuit comprises power consumption of the electrical circuit.
2. (original) A method as in claim 1, comprising:
statistically covering an entire space for the behavior of the electrical circuit.
3. (original) A method as in claim 2, wherein fully enumerating coverage of the entire space would require more than a predetermined computation time.
4. (original) A method as in claim 3, wherein the predetermined computation time is one week.
5. (canceled)
6. (original) A method as in claim 5 1, wherein the power consumption of the electrical circuit comprises leakage power of the electrical circuit and switching energy of the electrical circuit.
7. (original) A method as in claim 1, comprising:
using the trained neural network to form a profile of current versus time for the electrical circuit.
8. (original) A method as in claim 1, further comprising:
using the trained neural network to provide input data to a second neural network to form a second trained neural network, wherein the second trained neural network models the behavior of a second circuit, and wherein the second circuit comprises the electrical circuit and other circuitry.

9. (original) A method as in claim 1, wherein the step of forming the trained neural network comprises:

using a non-neural network model of the electrical circuit to generate input data for neural network training.

10. (original) A method as in claim 9, wherein the step of forming the trained neural network further comprises:

using the input data to train a neural network to produce the trained neural network.

11. (original) A method as in claim 9, further comprising:

using the input data to train a second neural network.

12. (currently amended) A method for fully modeling a behavior of at least a portion of an electrical circuit, comprising:

selectively modeling the behavior of a portion of the electrical circuit in order to generate a first plurality of cluster values for the behavior of the portion of the electrical circuit; training a first neural network to form a first trained neural network; generating a first plurality of cluster probabilities using the first trained neural network; and using the first plurality of cluster probabilities and the first plurality of cluster values, fully modeling the behavior of the portion of the electrical circuit, wherein the behavior of the electrical circuit comprises power consumption of the electrical circuit.

13. (canceled).

14. (original) A method as in claim ~~13~~ 12, wherein the power consumption comprises leakage power and switching energy.

15. (original) A method as in claim 12, further comprising:

using the trained neural network to form a profile of current versus time for the portion of the electrical circuit.

16. (original) A method as in claim 12, further comprising:

selectively modeling the behavior of the portion of the electrical circuit to produce input data for a higher level of modeling;
using the input data to generate a second plurality of cluster values for the behavior of the electrical circuit;
training a second neural network to form a second trained neural network;
generating a second plurality of cluster probabilities using the second neural network; and
using the second plurality of cluster probabilities and the second plurality of cluster values, fully modeling the behavior of the electrical circuit.

17. (original) A method as in claim 12, further comprising:

performing feature extraction on inputs to the first neural network and on inputs to the first trained neural network.

18. (currently amended) A method for modeling power consumption behavior of an electrical circuit, comprising:

generating a plurality of cluster power values for the electrical circuit;
training a neural network to form a trained neural network;
generating a plurality of cluster probabilities using the trained neural network; and
using the plurality of cluster probabilities and the plurality of cluster values, modeling the behavior of the electrical circuit, wherein the behavior of the electrical circuit comprises power consumption of the electrical circuit.

19. (original) A method as in claim 18, wherein the power consumption behavior of the electrical circuit comprises a leakage power component and a switching energy component.

20. (original) A method as in claim 18, comprising:

using the trained neural network to form a profile of current versus time for the electrical circuit.